

What is claimed is:

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1. A method of fabricating a semiconductor laser having a structure
in which an equivalent refractive index of two portions disposed apart from
each other is higher than that of adjacent portions to these portions in
5 a direction perpendicular to a waveguide direction as well as in parallel
with an activation layer, comprising the steps of:

forming said activation layer and a plurality of layers in parallel
with said activation layer;

10 forming a first groove penetrating through at least some of said
plurality of said layers;

selectively etching a specified layer among said some layers through
which said first groove penetrates, to a predetermined position toward both
sides from the first groove, thus forming a pair of second grooves; and

15 filling up said second grooves with a material having a refractive
index higher than that of said specified layer, thus forming two portions
having said high equivalent refractive index.

2. A semiconductor laser, which has a structure in which an equivalent
refractive index of two portions disposed apart from each other is higher
than that of adjacent portions to these portions in a direction perpendicular
20 to a waveguide direction as well as in parallel with an activation layer,
comprising:

said activation layer and a plurality of layers in parallel with
said activation layer,

wherein a first groove is formed penetrating through at least some
25 of said plurality of said layers;

a pair of second grooves extending from said first groove to

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predetermined positions toward both sides of said first grooves are formed in a specified layer among said layers through which said first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer, and thus two portions having said high equivalent refractive index are formed; and

another layer is formed so as to contact with the material having said high refractive index remaining on a surface portion of the first groove.

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3. A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer,

wherein a first groove is formed penetrating through at least some of said plurality of said layers;

a pair of second grooves extending from said first groove to predetermined positions toward both sides of said first groove are formed in a specified layer among said layers through which said first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer, and thus two portions having said high equivalent refractive index are formed; and

another layer made of a different material from that having the high refractive index is formed so as to contact with a surface portion of the

first groove.

4. A semiconductor laser, which has a structure in which an equivalent refractive index of two portions disposed apart from each other is higher than that of adjacent portions to these portions in a direction perpendicular to a waveguide direction as well as in parallel with an activation layer, comprising:

said activation layer and a plurality of layers in parallel with said activation layer,

wherein a first groove is formed penetrating through at least some 10 of said plurality of said layers;

a pair of second grooves extending from the first groove to predetermined positions toward both sides of the second groove are formed in a specified layer among said layers through which the first groove penetrates;

the second grooves are filled up with a material having a refractive index higher than that of the specified layer; and

layers made of a material having a refractive index are laminated on the material exposed in the first groove, this refractive index being lower than that of the material filled up in the second groove, and thus 20 the two portions having said high equivalent refractive index are formed outside the material having the low refractive index.

5. The semiconductor laser according to claim 4, wherein the material having the high refractive index and the material having the low refractive index are made of one refractive index distribution material, which gradually varies a refractive index thereof in a lamination direction of both of the materials.